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A New Species of *Nereiphylla* (Polychaeta, Phyllodocidae) from Hokkaido, Northern Japan

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A new phyllodocid species, *Nereiphylla hera* sp. nov., is described from Hokkaido, northern Japan, as the second Japanese species of this genus. The new species is distinguished from its congeners by flat, spatulate tentacular cirri with distinct tips.

Key Words: new species, *Nereiphylla*, Phyllodocidae, Polychaeta, Hokkaido

Introduction

The phyllodocid polychaete genus *Nereiphylla* was erected by Blainville (1828) based on *Nereiphylla paretii* Blainville, 1828. Recently Pleijel (1991) treated *Genetyllis* Malmgren, 1865 as a junior synonym of *Nereiphylla*, with an emendation of the diagnosis, and listed eight species of *Nereiphylla*. After that, Eibye-Jacobsen (1992) described *Nereiphylla mimica* from Belize and Pleijel and Mackie (1993) transferred *Anaitis pusilla* Claparède, 1870 to *Nereiphylla*. Therefore, ten species in total are known in the genus, excluding six taxonomically doubtful species (*G. brevis* Ehlers, 1890; *G. caeca* Averincev, 1972; *G. macrophthalma* Hartmann-Schröder, 1979; *G. oculata* McIntosh, 1885; *G. undulaticirrus* Averincev, 1972; and *G. violacea* Hartmann-Schröder, 1965). Species of *Nereiphylla* are found from the intertidal to bathyal zones (0-500m), and from the bottoms of mud, sand, gravel, stones, or shells, but there is little information about their biology or ecology.

Nereiphylla castanea (Marenzeller, 1879) was originally described from Enoshima, central Honshu, and is a common member of the intertidal fauna around southern Japan, listed in numerous faunal surveys (Izuka 1912; Okuda 1938; Imajima and Hartman 1964; Uchida 1988). Until now this has been the only species of the genus recorded from Japan. As a result of our studies of phyllodocid polychaetes along the coast of Japan, about 70 specimens belonging to the genus *Nereiphylla* were collected intertidally from Hokkaido, northern Japan, in 1994 and 1998. These specimens have unique spatulate tentacular cirri with distinct tips and are described below as a new species.

Material and Methods

Animals were relaxed in isotonic MgCl₂, fixed in CaCO₃-buffered formalin in seawater (10%) for at least 24 hrs, rinsed in fresh water, and transferred to 70% ethanol for preservation. Drawings were made from preserved specimens using a

camera lucida.

For SEM observation, specimens were relaxed similarly, fixed in 1% OsO₄ in filtered artificial seawater for one hour, dehydrated through an alcohol series, freeze dried, sputter-coated with gold, and examined in a JEOL JSM-5400LV.

Abbreviations used in the text: Naturhistorisches Museum Wien, NMW; Zoological Institute Faculty of Science Hokkaido University, ZIHU.

Genus *Nereiphylla* Blainville, 1828

Nereiphylla Blainville, 1828: 466.

Genetyllis Malmgren, 1865: 93.

Nereiphylla: Pleijel, 1991: 234, characters emended.

Diagnosis. Four antennae, usually swollen medially; median antenna absent. Eyes large. Nuchal papilla absent. Prostomium rounded. Proboscis long and slender, with diffusely distributed rounded papillae. Tentacular cirri cylindrical or slightly flattened. Segments 1 and 2 dorsally fused. Segmental bands of cilia absent. Parapodia uniramous. Dorsal cirri cordiform and longer than broad, or, rarely, broader than long. Ventral cirri large, obliquely attached to neuropodia, usually covering neuropodia in posterior view. Pygidial cirri cylindrical, pointed. Median pygidial papilla present or absent.

Nereiphylla was previously distinguished from *Genetyllis* by having flattened rather than cylindrical tentacular cirri. Pleijel (1991) emended the diagnosis of *Nereiphylla* and treated *Genetyllis* as a junior synonym of *Nereiphylla* because larger specimens of the type species of both *Nereiphylla* and *Genetyllis* have slightly flattened tentacular cirri.

Nereiphylla hera sp. nov.

(Figs 1-3)

Material examined. Holotype: ZIHU 1124, complete specimen; intertidal mussel bed, Kikonai, southern Hokkaido (10 June 1994; T. Kato coll.). Paratypes: ZIHU 1125-1147, 23 specimens, data as for holotype; 3 specimens, (NMW), data as for holotype. Other material: ZIHU 1148, 7 specimens, mussel bed, intertidal, Oshoro, southwest Hokkaido (3 September 1994; T. Kato coll.); ZIHU 1149, 6 specimens, mussel bed, intertidal, Oshoro (28 September 1994; T. Kato coll.); ZIHU 1150, 5 specimens, mussel bed, intertidal, Oshoro (7 March 1995; T. Kato coll.); ZIHU 1151, 13 specimens, mussel bed, intertidal, Oshoro (3 September 1995; T. Kato coll.); ZIHU 1152, 6 specimens, mussel bed, intertidal, Oshoro (2 October 1995; T. Kato coll.); ZIHU 1153, 3 specimens, among seaweed holdfasts, intertidal, Muroran, southwest Hokkaido (13 June 1994; T. Kato coll.); ZIHU 1154, 2 specimens, depth 5-15 m, Usujiri, south Hokkaido (21 July 1994; S. Goshima coll.); ZIHU 1155, 1 specimen, subtidal, Otaru-Chikko, southwest Hokkaido (8 August 1994; T. Suwa coll.); 3 specimens, Oshoro (21 July 1998; T. Kato coll.) (mounted for SEM).

Measurements. Holotype, 35.9 mm long, 1.18 mm wide at middle of body, including parapodia, excluding setae, with 162 segments. Measurements from the entire type series are presented in Table 1.

Table 1. Measurements of type specimens of *Nereiphylla hera* sp. nov. The number of parapodial segments (No. seg.), body length (BL), body width (BW), and condition of material are shown for each specimen.

Spec.	No. seg.	BL(mm)	BW(mm)	Condition	deposition
1	83	22.6	1.25	AF	ZIHU 1125
2	119	34.3	1.33	AF	ZIHU 1126
3	153	59.1	1.80	AF	ZIHU 1127
4	201	51.7	1.20	C	NMW
5	203	56.2	1.30	C, R	ZIHU 1128
6	213	45.2	1.28	C	ZIHU 1129
7	162	35.9	1.18	C, Holotype	ZIHU 1124
8	161	33.3	1.18	C	ZIHU 1130
9	93	25.0	1.25	AF	ZIHU 1131
10	143	36.9	1.40	AF	ZIHU 1132
11	123	30.3	1.00	AF	ZIHU 1133
12	181	46.4	1.28	AF	ZIHU 1134
13	149	27.9	0.95	C	NMW
14	218	65.7	1.53	C, AB	ZIHU 1135
15	172	41.5	1.20	C	ZIHU 1136
16	176	67.2	1.54	AF, F	ZIHU 1137
17	171	49.7	1.41	C, AB	ZIHU 1138
18	121	22.2	0.98	C	ZIHU 1139
19	40	4.7	0.53	C	ZIHU 1140
20	47	5.9	0.54	C	ZIHU 1141
21	98	14.0	0.83	C	ZIHU 1142
22	90	19.5	1.13	AF	ZIHU 1143
23	38	4.5	0.56	C	ZIHU 1144
24	93	17.1	0.85	C, R	ZIHU 1145
25	78	11.7	0.80	C	NMW
26	54	8.1	0.68	C	ZIHU 1146
27	49	6.9	0.58	C	ZIHU 1147

AB: Abnormal specimen, AF: Anterior fragment, C: Complete, F: Female, R: Specimen with regenerated caudal end.

Etymology. This species is named for its unique spatulate tentacular cirri (*hera* is Japanese for spatula; noun in apposition).

Description. Body slender, of uniform width, with tapering posterior end. Prostomium anteriorly rounded, about as long as wide (Figs 1A, 2A). One pair of eyes; large, rounded lenticular, located slightly behind middle of prostomium near lateral margins. Antennae about as long as prostomium, medially inflated, distally tapering to narrow tip (Figs 1B, 2A). Proboscis entirely covered by numerous small, rounded papillae, irregularly arranged. Proboscis without terminal ring of papillae.

Tentacular cirri flat, spatulate with distinct narrow tip (Figs 1D, E, F, 2A). Dorsal tentacular cirri of segments 2 and 3 longest, reaching to about segment 6. Tentacular cirri of segment 1 short, extending to segment 4. Ventral tentacular cirri of segment 2 very short, reaching to segment 4. Segment 2 lacking neuropodia, with setae

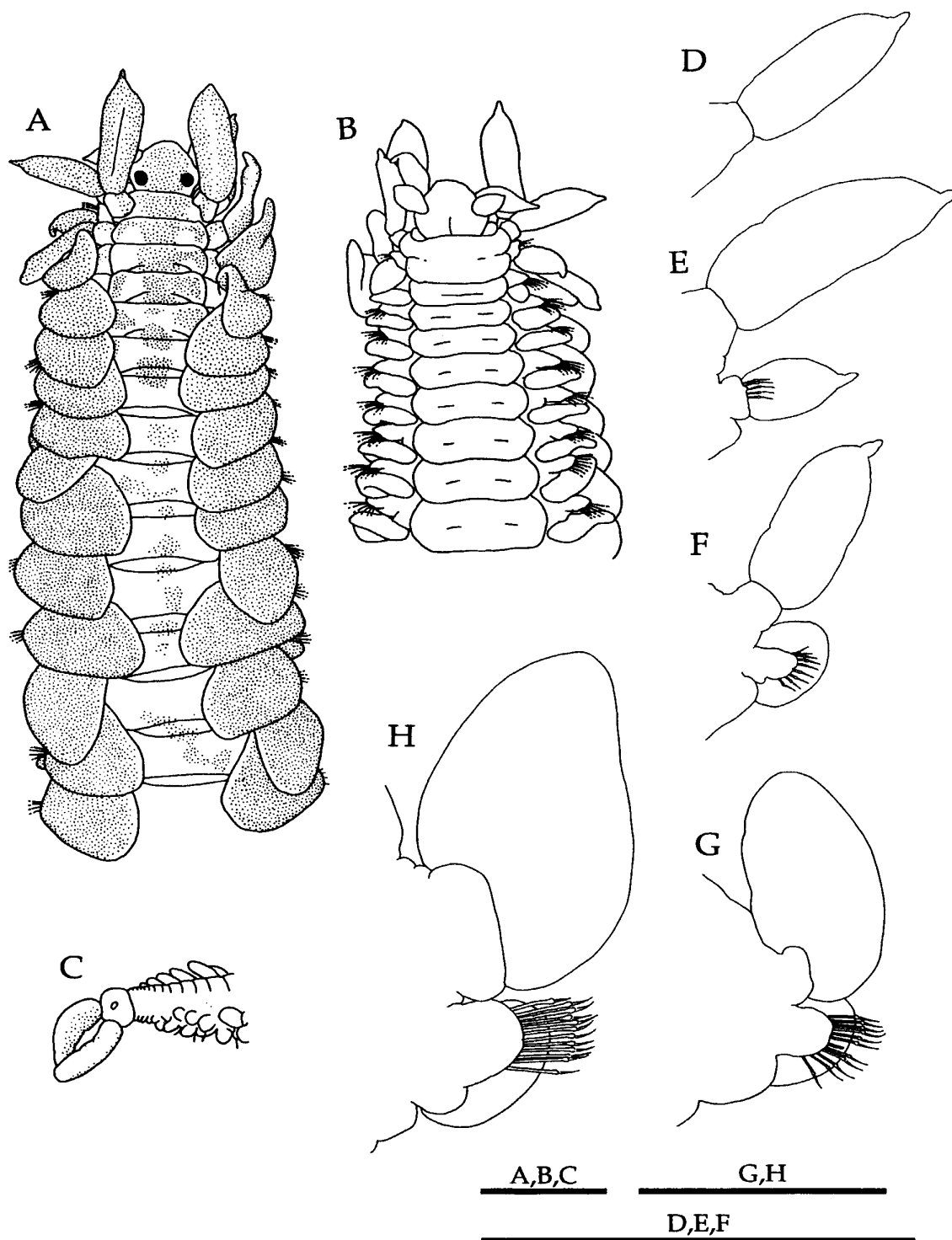


Fig. 1. *Nereiphylla hera* sp. nov. A-C, holotype. D-F, ZIHU 1125. G-H, ZIHU 1126. A, anterior end, dorsal view; B, anterior end, ventral view; C, posterior end, dorsal view; D, first parapodium, anterior view; E, second parapodium, anterior view; F, third parapodium, anterior view; G, fifth parapodium, anterior view; H, 70th parapodium, anterior view. Scale lines 500 μ m.

emerging from cirrophores of ventral tentacular cirri (Figs 1E, 2B). Segment 3 with neuropodia and small ventral cirri.

Neuropodia about as long as one third of width of body segments (Fig. 1G, H), rounded rectangular, with about 15 compound setae. Rostrum of setal shafts with large number of teeth, decreasing in size proximally (Fig. 2D). Setal blades short, denticulate along one side. Dorsal cirri of median segments asymmetrical, heart-shaped, longer than broad, with rounded tips. Ventral cirri elongate, longer than neuropodia, obliquely attached to neuropodia, covering neuropodia in posterior view. Pygidial cirri slightly flattened, about 2-3 times as long as broadest width, with rounded tip (Fig. 1C). Pygidial papilla present (Fig. 2C).

Colour: Live specimens with body yellow to yellowish green with dark brown pigmentation. Dorsal cirri dark brown. Ventral cirri yellowish brown with brown edges. Eyes blackish brown. Preserved specimens uniformly orange to red brown without dark dorsal pigmentation. Dorsal and ventral cirri darker than body. Eyes black.

Aberrant specimens: Paratypes include two aberrant individuals. One specimen (ZIHU 1138) has 7 pairs of tentacular cirri (Fig. 3A) with a tentacular formula of $1 + 1/1 + 4/N$ on the left side and $1 + 2/1 + 3/N$ on the right. Another specimen (ZIHU 1135) has two pairs of pygidial cirri instead of the usual condition of one pair (Fig. 3B).

Occurrence. Kikonai, Oshoro, Muroran, and Usujiri (Hokkaido, Japan).

Remarks. The present species is assigned to *Nereiphylla* Blainville, 1828, having the character combination of no median antenna, no nuchal papilla, four pairs of tentacular cirri, dorsally reduced first segment, obliquely oriented ventral cirri, and characteristic *Nereiphylla*-type setae (Eibye-Jacobsen 1991) possessing a short blade and numerous teeth on the rostrum of the shaft.

Nereiphylla hera is distinguishable from its congeners by the spatulate tentacular cirri with a distinct tip and the parapodia with an elongated dorsal cirrus. The present new species most closely resembles *N. rubiginosa* (Saint-Joseph, 1888) from the Atlantic coast of western Europe and the northern Mediterranean. We examined one specimen of *N. rubiginosa* collected from the English Channel (deposited at Musée Zoologique, Strasbourg, France, Myèvre coll.) and two newly collected specimens from Marseille (one collected by J.-G. Harmelin, another by T. Kato). The two species are similar in body size and share a rounded prostomium with antennae as long as the prostomium, elongated heart-shaped dorsal cirri, and reniform ventral cirri. *Nereiphylla hera*, however, differs from *N. rubiginosa* in having flat, spatulate tentacular cirri with distinct tips (cylindrical in *N. rubiginosa*), and in lacking subapically hooked papillae on the proximal part of proboscis (the possession of hooked proboscideal papillae is a unique character of *N. rubiginosa*: see Pleijel and Dales 1991).

Nereiphylla fragilis (Webster, 1879) from the Gulf of Mexico has flattened tentacular cirri, similar to those of *N. hera*. The tentacular cirri of *N. fragilis* were described by Webster (1879) as "diameter nearly uniform to near the end, where they taper slightly to a bluntly rounded termination", and they were illustrated as stout as their cirrophores. On the other hand, the tentacular cirri of *N. hera* are broader than their cirrophores and have distinct narrow tips.

Nereiphylla castanea was described from Eno-shima, Japan, by Marenzeller (1879) as *Carobia castanea* and was previously the only known species of the genus

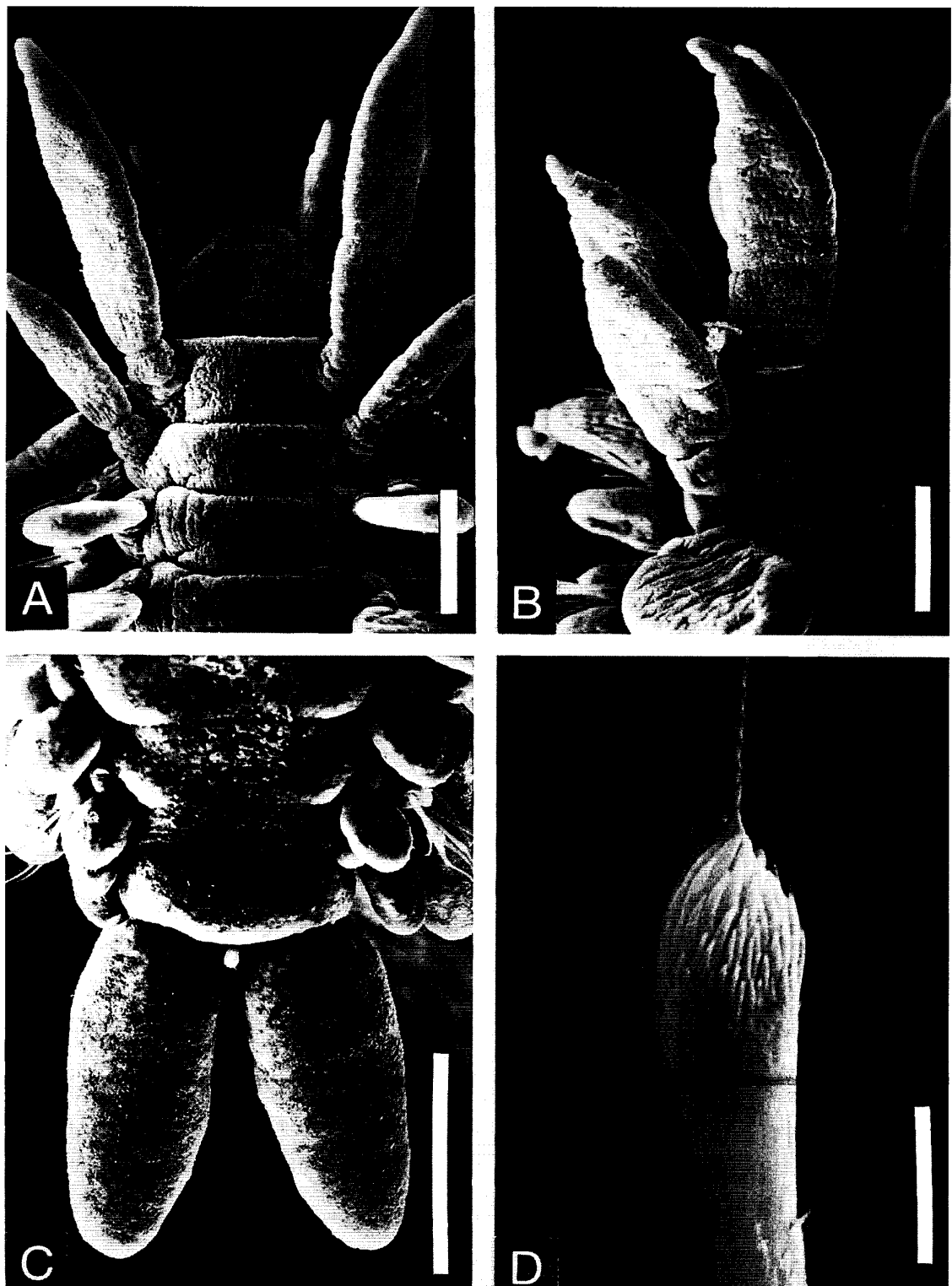


Fig. 2. *Nereiphylla hera* sp. nov. SEM micrographs of specimens from Oshoro, Hokkaido, Japan. A. anterior end, dorsal view; B. tentacular cirri, dorso-lateral view; C. posterior end, ventral view; D. rostrum of setal shaft, median parapodium. Scale lines A-C 100 μ m, D 5 μ m.

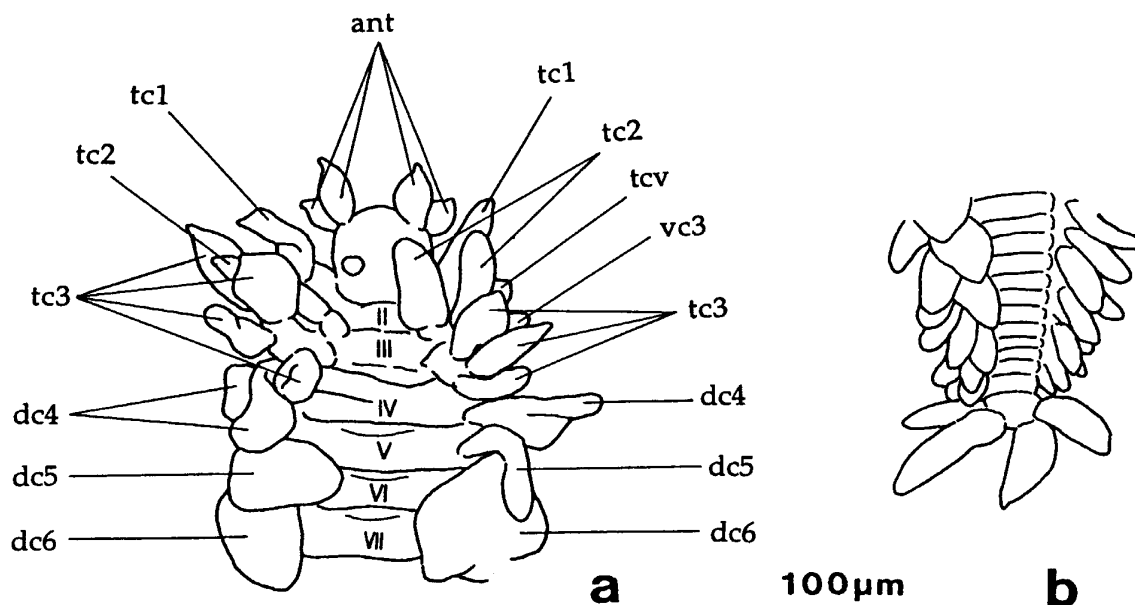


Fig. 3. Two aberrant specimens of *Nereiphylla hera* sp. nov. A, anterior end of ZIHU 1138, dorsal view; B, posterior end of ZIHU 1135, dorsal view. ant: antenna, dc4-6: dorsal cirri of segments 4-6, tc1-3: tentacular cirri of segments 1-3, tcv: ventral tentacular cirrus of segment 2, vc3: ventral cirrus of segment 3, II-VII: segment number.

from Japanese waters. Careful examination of the holotype (NMW 523) together with six specimens of *N. castanea* newly collected from Misaki, Kanagawa, Japan, by T. Kato revealed that *Nereiphylla castanea* is distinguished from *N. hera* in having cylindrical tentacular cirri and shorter and rounded dorsal cirri. Moreover, the dorsal cirri of *N. castanea* tend to become detached from the body of fixed specimens, whereas the dorsal cirri of *N. hera* remain attached to the body following fixation.

An aberrant specimen of *N. hera* was recorded to have seven non-symmetrical pairs of tentacular cirri. A similar abnormality has previously been reported for *N. castanea*; Blake (1994) illustrated five tentacular cirri on the left side of a specimen from California.

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